ELSIE M. SUNDERLAND

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ACADEMIC APPOINTMENTS & PROFESSIONAL EXPERIENCE

Harvard University, Cambridge MA, USA

2022-present Fred Kavli Professor of Environmental Chemistry and Professor of Earth and Planetary Sciences, Harvard University

2018-present Professor of Environmental Science and Engineering,
Department of Environmental Health, Harvard T.H. Chan School of Public Health (HSPH)

2021-2022 Professor of Earth and Planetary Sciences, Harvard Faculty of Arts and Sciences

2018-2022 Gordon McKay Professor of Environmental Chemistry,
Harvard John A. Paulson School of Engineering and Applied Sciences (SEAS)

2018-2021 Faculty Affiliate, Department of Earth and Planetary Sciences, Harvard University

2015-2018 Thomas D. Cabot Associate Professor of Environmental Science and Engineering, SEAS

2014-2018 Associate Professor of Environmental Science and Engineering,
Department of Environmental Health, HSPH

2014-2015 Associate Professor of Environmental Science and Engineering, SEAS

2010-2014 Mark and Catherine Winkler Assistant Professor of Aquatic Science, HSPH

2008-2010 Research Associate, SEAS & Harvard Center for Risk Analysis, HSPH

U.S. Environmental Protection Agency, Washington DC, USA

2004-2008 Worked in the Office of Science Policy; Office of the Science Advisor; National Center for Environmental Research; National Center for Environmental Economics; National Exposure Research Laboratory. *Positions and responsibilities included*:

- Led cross-Agency workgroup drafting guidance on the development, evaluation and application of environmental models used to inform regulatory decisions.
- Developed policy recommendations for nearshore water quality in the Great Lakes as the representative for the International Air Quality Planning Board (IAQAB) of the International Joint Commission (IJC).
- Developed federal regulations for atmospheric emissions of hazardous air pollutants from coal-fired utilities.

Lunenburg Municipal Government, Bridgewater NS, Canada

1994-1995 Assisted in the development of the first fully integrated four waste stream management system in North America (large-scale recycling and composting).

EDUCATION

1997 B.Sc., Environmental Science, McGill University, Canada

2003 Ph.D., Environmental Toxicology, Simon Fraser University, Canada

2003-2004 Postdoctoral Fellow, Office of Science Policy, US Environmental Protection Agency

PERSONAL

Citizenship: dual, Canada and United States.

ACADEMIC & PROFESSIONAL HONORS

2019-2023	Web of Science Highly Cited Researcher (multiple highly cited papers in top 1% of field)
2017	Harvard Star Family Award for Promising Scientific Research
2013	Excellence in Reviewing Award from journal *Biogeochemistry*
2012	Smith Family Foundation Award for Excellence in Biomedical Research
2010	U.S. EPA Level II Scientific & Technological Achievement (STAA) Award
2010	Outstanding Reviewer citation by Editorial Board of *Estuaries and Coasts*
2008	U.S. EPA Level I (highest level) Scientific & Technological Achievement (STAA) Award
2005	U.S. EPA National Honor Award, Gold Medal for Exceptional Service
2003	Dean's Convocation Medal (best graduate thesis), Simon Fraser University
2002	Society of Environmental Toxicology & Chemistry best student paper presentation
1998-2002	Natural Sciences and Engineering Research Council of Canada Graduate Fellowships
1993	Greville Smith Scholarship (top-entrance scholarship), McGill University
1993	Canada Scholarship, Industry and Technology Canada

RECENT PROFESSIONAL SERVICE

Editorial

2024-present	Editor in Chief, *Environmental Science: Processes and Impacts*
2021-present	Editorial Advisory Board, *ACS Environmental Au*
2018-present	Editorial Advisory Board, *Environmental Science & Technology*
2017-2023	Editorial Advisory Board, *Environmental Science: Processes and Impacts*
2022-2023	Guest Editor, Special Issue: Per- and polyfluoroalkyl substances, *Current Opinion in Green and Sustainable Chemistry* (with Ralf Ebinghaus and Lutz Ahrens)
2021-2022	Guest Editor, Special Issue: Biogeochemistry of Trace Elements, *Environmental Science: Process & Impacts* (with Lenny Winkel, ETH)
2018-2022	Editorial Board Member, *International Journal of Environmental Research and Public Health (IJERPH)*
2021	Guest Editor, *Environmental Science: Processes and Impacts* on Biogeochemistry of Trace Elements
2020	Guest Editor, *iScience* on PFAS contamination and remediation
2018	Guest Editor, *ACS Earth and Space Science*, 2018, Special Issue on Global Mercury Cycling

International

2022-	Advisory Board, Back to Blue Initiative on Ocean Pollution, Economist Impact Group and Nippon Foundation
2020-2021	Theme co-chair, GeoHealth, Goldschmidt 2021, virtual meeting, 4-9 July, 2021.
2019	Scientific Observer/Expert for the *ad hoc* committee on Effectiveness Evaluation for the Minamata Convention on Mercury, UNEP.
2018-2019	Planning Committee and Exposure Workgroup Co-Chair, SETAC Special Topic Meeting on PFAS Risk Assessment, Durham, NC, August 12-15, 2019.
2017-2019	Scientific Steering Committee, 14th International Conference on Mercury as a Global Pollutant, Krakow, Poland, 2019.
2017-2018	Contributor, 2018 UNEP Global Mercury Assessment (atmospheric and biotic workgroups).

National

2022-23	Steering Committee, National Forum on Contaminants in Fish organized by the US Environmental Protection Agency.
2020-2022	Expert advisor for U.S. State Department and US EPA delegation for the Minamata Convention.
2021	Expert consultant for the Fond du Lac Tribe, MN on environmental pollution issues August 2021.
2020	U.S. National Academies planning committee and session chair for Federal Government Human Health PFAS Research Workshop, October 26-27, 2020.
2019	U.S. National Academies of Science, Engineering and Medicine: Workshop Planning Committee on Perfluoroalkyl and Polyfluoroalkyl Substances in the Environment - A Systems Approach to Exploring Exposure and Identifying Opportunities for Leadership, September 26-27, 2019.

University Service: Harvard

2024-	Chair, SEAS working group on Climate/Sustainability/Energy
2024-	Member, SEAS Professional Programs Working Group
2023-	Member, Aramont Fund Review Committee, Vice-Provost for Research Office
2023-	Board of Tutors, Concentration in Environmental Science and Public Policy
2023-	Member, Climate cluster hire search committee, SEAS
2023-	Area Chair, Graduate Admissions Committee, SEAS
2022	Harvard Committee on Climate Education
2021-22	Harvard Provost's Academic Leadership Forum
2020-22	Director of Undergraduate Studies, Environmental Science and Engineering, SEAS
2020-22	Undergraduate Engineering Committee, SEAS
2019-22	Harvard Standing Committee on Oceanography
2019-22	Honors Committee, Environmental Science and Public Policy Board of Tutors
2016-22	Standing Committee on the Concentration in Environmental Science and Public Policy
2018-22	Harvard Standing Committee on Women
2019-22	Presidential Committee on Sustainability, Member
2019-22	Harvard Faculty Council, Division Representative for Natural and Applied Sciences
2020-22	Mentoring Committee, Department of Earth and Planetary Sciences
2020-21	Review Committee, Harvard Hoopes Prize for Natural Sciences Undergraduate Research
2020-21	Harvard Faculty of Arts and Sciences financial study working group
2017-20	Director of Graduate Studies, Environmental Science and Engineering, SEAS
2019-20	Docket Committee, Harvard Faculty of Arts and Sciences
2018-20	Member, Faculty search committee in Risk Assessment, HSPH
2018-19	Member, Faculty search committee in Marine Biology, Organismic and Evolutionary Biology (OEB)
2018-19	Member, Faculty search committee in Earth History, Earth and Planetary Sciences (EPS)
2018	Harvard Campus Sustainability Innovation Fund (CSIF) Review Committee
2017-18	Harvard University child-care vendor selection committee
2017-18	Harvard Food Sustainability Standards Committee
2017-18	Member, Faculty search committee in Climate Science (EPS/SEAS)
2016-18	Harvard Alumni Association Speakers Bureau
2016-17	Harvard University Climate Change Task Force
2016-17	Harvard Office of Sustainability Healthy Buildings Initiative

RESEARCH MENTORING

Doctoral Students:

[17] Olivia Pietz (PhD 2023-; G1); [16] Evan Routhier (PhD 2022-; G2); [15] Jahred Liddie (Sc.D. 2021-, G4); [14] Mona Dai (2020-; G5); [13] Heidi Pickard (2020-; G5); [12] Jennifer Sun (2019-; G6); [11] Ben Geyman (2019-; G6); [10] Bridger Ruyle (2018-2022, now postdoc Carnegie Inst.); [9] Rebecca Stern (PhD 2016-2021, now postdoc HSPH); [8] Charlotte Wagner (PhD 2015-2021, now scientist Stockholm Env. Inst.); [7] Andrea (Weber) Tokranov (PhD 2013-2019, now hydrologist USGS); [6] Xindi Hu (Sc.D. 2014-2018, now lead data scientist Mathematica); [5] Clifton Dassuncao (Sc.D. 2013-2018, now Vice President ERG); [4] Ryan Calder (Sc.D. 2012-2017, now Asst. Prof. Virginia Tech.); [3] Hannah Horowitz (PhD 2011-2017, now Asst. Prof. U. Illinois); [2] Miling Li (Sc.D. 2011-2016, now Asst. Prof., U. Del.); [1] Helen Amos (PhD 2010-2014, now senior scientist NASA).

Master's Students:

[5] Adela Chovancova (2017-18, now Regulatory and Compliance Manager at Catania Oils); [4] Paheliya Aixilafu (2016-17, now Doctoral candidate, U. Michigan); [3] Amelia Valberg (2014-15, now Senior Consultant, Rambold); [2] Matthew Tumpney (2011-12, now Epidemiologist, MA DEP); [1] Elizabeth Corbitt (2010-15, now science teacher Louisiana).

Undergraduate Research Assistants, Thesis and/or Independent Study Students

[28] Jack Bruce (2022-present), [27] Sharmila Day (2022-present), [26] Sophia Ludtke (2022-present), [25] Julia Mansfield (2022-present), [24] Sarah Beckwith (2021-22) [23] Evan Hunsicker (2021-22), [22] Jordan Daigle (2021), [21] Elida Kocharian (2020), [20] Maya Levine (2020-22), [19] Jonas LaPier (2019-21), [18] Jenn Greiner (2020-21), [17] Cecil Myers (2019-20), [16] Daniel Chang (2019-20), [15] Beverly Ge (2017-19), [14] Chandler Brown (2018-19), [13] Nicole Nishizawa (2017-19), [12] Helen Kim (2018), [11] Amira Hannon (2018), [10] Bruno Moguel Gallegos (2017-18), [9] Alina McIntyre (2017), [8] Nakoa Farrant (2017-18), [7] Alicia Juang (2016-18), [6] Jessica Ewald (2015-17), [5] Harry Stone (2015-16), [4] Jahred Liddie (2014-16), [3] Sam Krabbenhoft (2015), [2] Angela Jiang (2014), [1] Kurt Bullard (2014).

Postdoctoral Fellows/Research Associates:

[17] Yumin Zhu (2023-present); [16] Connor Olson (2023-present); [15] Fabian Fischer (2022-2023, now Asst. Prof. URI); [13] Scott Zolkos (2020-2022, now Scientist at Woodwell Climate Research Center); [12] Lara Schultes (2019-2021, now Environmental Consultant, Stockholm, Sweden); [11] Colin Thackray (2016-2021, now Research Scientist, Sunderland Lab); [10] Maxime Enrico (2019-2021, now Postdoctoral Fellow, Université de Pau, France); [9] Kyle Delwiche (2018-2019, now Res. Scientist, UC Berkeley); [8] Marie Perkins (2017-2019, now Asst. Prof. UW Stevens Point); [7] Linjun Yao (2017-2019, now Scientist, MA DEP); [6] Amina Schartup (2012-2017, now Assoc. Prof., Scripps Institute of Oceanography); [5] Xianming Zhang (2013-2016, now Asst. Prof., Concordia U.); [4] Yanxu Zhang (2013-2015, now Professor, Nanjing U.); [3] Anne Soerensen (2011-2014, now Curator, Swedish Museum of Natural History); [2] Asif Qureshi (2011-2013, now Associate Professor, IIT Hyderabad, India); [1] Jenny Fisher (2011-2012; now Senior Lecturer, U. of Wollongong, Australia).

Doctoral Examination Committees - External Universities

[9] Frits Steenhuisen, University of Groningen (Examining Committee, 2023); [8] Connor Olsen, Syracuse University (Committee Member, 2021-2023); [7] Aryeh Feinberg, ETH, Switzerland (Examining Committee, 2020); [6] Lara Schultes, Stockholm University, Sweden (Opponent, 2019); [5] Amanda Giang, MIT, Institute for Data, Systems and Society (Committee Member, 2013-2017); [4] Michelle Mastromonaco, Chalmers University of Technology, Sweden (Opponent, 2016); [3] Matthew Binnington, University of Toronto, Canada (External Examiner, 2016); [2] Ravinder Pannu, University of Saskatchewan, Canada (External Examiner, 2012); [1] Adrienne Ethier, University of Ottawa, Canada (External Examiner, 2009).

TEACHING

Active:

EPS/ESE-161 Undergraduate Course, Applied Environmental Toxicology, Harvard School of Engineering and Applied Sciences, Spring 2015; Fall 2016; Fall 2019; Spring 2022, Spring 2024.

EPS/ESE-169 Undergraduate Course, Seminar on Global Pollution Issues, Harvard School of Engineering and Applied Sciences, Spring 2013; Fall 2017; Spring 2021; Fall 2023.

Past:

EPS/ESE-6 Undergraduate Course, Introduction to Environmental Science and Engineering, Harvard School of Engineering and Applied Sciences, Spring 2016-2018; 2020-2021.

ES-298r Graduate Course: Mitigating Toxicity Through Materials Design, Harvard School of Engineering and Applied Sciences, Fall 2015.

RDS-500 Graduate Course: Risk Assessment, Department of Environmental Health, Harvard School of Public Health, Spring 2011-2014.

ENVR E-215 Graduate Course: Environmental Science, Harvard Extension School, Fall 2011.

Other teaching activities:

2009-2023 Faculty, Analyzing Risk: Science, Assessment, and Management; Center for Continuing Professional Education, Harvard School of Public Health. (~60 students each year).

2008 Developed curriculum and instructed training course on the use of models in environmental regulatory decision-making for U.S. EPA Region 1. (~50 staff members).

2004-2008 Led nation-wide seminar series (webinar) for ten U.S. EPA Regional Offices on the use of environmental models to inform environmental management decisions.

PUBLICATIONS

*Students and postdocs mentored are underlined. Senior author indicated by the last position. *Denotes undergraduates.*

PEER-REVIEWED JOURNALS

2024

125. P. Shende, L. Zifeng, **E.M. Sunderland**, A. Qureshi. 2024. Potential reductions in fine particulate matter and premature mortality following implementation of air pollution controls on coal-fired power plants in India. *Air Quality, Atmosphere & Health.* Accepted.

124. F. Fischer, *S. Ludtke, C.P. Thackray, H. Pickard, F. Haque, C. Dassuncao, S. Endo, L. Schaider, **E.M. Sunderland.** 2024. Binding of per- and polyfluoroalkyl substances (PFAS) to serum proteins: Implications for toxicokinetics in humans. https://doi.org/10.1021/acs.est.3c07415.

123. M. Dunn, N. Noons, S. Vojta, J. Becanova, H. Pickard, **E. Sunderland**, R. Lohmann. 2024. Unregulated active and closed textile mills represent a significant vector of PFAS contamination into coastal rivers. *ES&T Water*. https://doi.org/10.1021/acsestwater.3c00439.

122. C. Richon, C. Wagner, **E.M. Sunderland**, A. Tagliabue. 2024. A global biogeography analysis reveals vulnerability of surface marine zooplankton to anthropogenic stressors. *One Earth*. 7, 1-15.

2023

121. B.J. Ruyle, H.M. Pickard, L. Schultes, F. Fredriksson, A.L. Heffernan, D.R.U. Knappe, H.L. Lord, P. Meng, M.A. Mills, K. Ndung'u, P. Roesch, J. Van Buren, C. Vogel, D.C. Westerman, L.W.Y. Yeung, **E.M. Sunderland**. 2023. An interlaboratory comparison of extractable organofluorine measurements in groundwater and eel (*Anguilla rostrata*): Recommendations for methods standardization. *Environmental Science & Technology.* 57(48): 20159-20168.

120. B.M. Geyman, C.P. Thackray, D.J. Jacob, **E.M. Sunderland**. 2023. New satellite data for SO_2 suggests higher volcanic mercury emissions concentrated in the Northern Hemisphere. *Geophysical Research Letters.* 50 (21), e2023GL104667.

119. M.Q. Dai, B.M. Geyman, X.C. Hu, C.P. Thackray, **E.M. Sunderland**. 2023. Sociodemographic disparities in mercury exposure from U.S. coal-fired power plants. *Environmental Science & Technology Letters*. 10(7): 589-595.

118. B.J. Ruyle, C.P. Thackray, C. Butt, D. LeBlanc, A.K. Tokranov, C.D. Vecitis, **E.M. Sunderland**. 2023. Centurial persistence of forever chemicals at military fire training sites. *Environmental Science & Technology*. 57(21), 8096-8106.

117. J. Liddie, L. Schaider, **E.M. Sunderland**. 2023. Sociodemographic factors are associated with the abundance of PFAS sources and detection in U.S. community water systems. *Environmental Science & Technology*. 57(21), 7902-7912.

116. B.J. Ruyle, L. Schultes, D.M. Akob, C.R. Harris, M.M. Lorah, S. Vojta, J. Becanova, S. McCann, H.M. Pickard, A. Pearson, R. Lohmann, C.D. Vecitis, **E.M. Sunderland**. 2023. Nitrifying bacteria linked to biotransformation of perfluoroalkyl sulfonamido precursors from legacy aqueous film forming foams. *Environmental Science & Technology*. 56(22): 15573-15583.

115. X.C. Hu, M. Dai, J.M. Sun, **E.M. Sunderland**. 2023. The utility of machine learning models for predicting chemical contaminants in drinking water: Promise, challenges, and opportunities. *Current Environmental Health Reports*. 29(2): 131-147.

2022

114. A.S. Young, H.M. Pickard, **E.M. Sunderland**, J.G. Allen. Organic fluorine as an indicator of per- and polyfluoroalkyl substances in dust from buildings with healthier versus conventional materials. *Environmental Science & Technology*. 56(23): 17090-17099.

113. H.M. Pickard, B.J. Ruyle, C. Dassuncao, A. Chovancovaa, C.P. Thackray, J. Becanova, S. Vojta, R. Lohmann, **E.M. Sunderland**. 2022. Bioaccumulation of PFAS and precursors in freshwater recreational fish and implications for fish advisories. *Environmental Science & Technology*. 56(22): 15573-15583.

112. K.B. Delwiche, J.A. Harrison, J.D. Maasakkers, M.P. Sulprizio, J. Worden, D.J. Jacob, **E.M. Sunderland**. 2022. Estimating drivers and pathways for hydroelectric reservoir methane emissions using a new process-based model. *Journal of Geophysical Research - Biogeosciences*. 127 (8), e2022JG006908.

111. L. Muñoz-Abri, C.A. Valle, J.J. Alava, S.E. Janssen, **E.M. Sunderland**, F. Rubianes-Landázuri, S.D. Emslie. 2022. Elevated mercury concentrations and isotope signatures (C, N, Hg) in yellowfin tuna (*Thunnus albacares*) from the Galápagos Marine Reserve and waters off Ecuador. *Environmental Toxicology and Chemistry*. 41 (11), 2732-2744.

110. G.A. de Vera, B.Y. Brown, S. Cortesa, M. Dai, J. Bruno, J. LaPier, N. Sule, M. Hancock, B. Yoon, A. Chalah, **E.M. Sunderland**, S.C. Wofsy. 2022. HazeL: A low-cost learning platform for aerosol measurements. *Journal of Chemical Education.* 99(9): 3203-3210.

109. C.I. Olson, B.M. Geyman, C.P. Thackray, D.P. Krabbenhoft, M.T. Tate, **E.M. Sunderland**, C.T. Driscoll. 2022. Mercury in soils of the conterminous United States: Patterns and pools. *Environmental Research Letters*. 17(7), 074030.

108. J.M. Sun, B.C. Kelly, F.A.P.C. Gobas, **E.M. Sunderland**. 2022. A food web bioaccumulation model for the accumulation of poly- and perfluoroalkyl substances (PFAS) in fish: How important is renal elimination? *Environmental Science: Processes & Impacts*. 24(8), 1152-1164

107. C.D. Golden, J. Ayroles, J.G. Eurich, J.A. Gephart, K.L. Seto, M.K. Sharp, P. Balcom, H.M. Barravecchia, K.K. Bell, K.D. Gorospe, J. Kim, W.H. Koh, J. Z. Mason, D. McCauley, H. Murdoch, N. Nair, K. Neeti, S. Passarelli, A. Specht, **E. Sunderland**, A.Tekaieti, A. Tekiau, R. Tekoaua, E. Timeon. 2022. Study Protocol: Interactive dynamics between coral reef fisheries and the nutrition transition in Kiribati. *Frontiers in Public Health: Planetary Health*. 10: 890381.

106. S. Zolkos, A.V. Zhulidov, T.Y. Gurtovaya, V.V. Gordeev, S. Berdnikov, N. Pavlova, E.A. Kalko, Y. A. Kuklina, D.A. Zhulidov, L. S. Kosmenko, A. I. Shiklomanov, A. Suslova, B.M. Geyman, C. P. Thackray, **E.M. Sunderland**, S.E. Tank, J. W. McClelland, R. G.M. Spencer, D.P. Krabbenhoft, R. Robarts, R. M. Holmes. 2022. Multi-decadal declines in particulate mercury and sediment export from Russian rivers in the pan-Arctic basin. *Proceedings of the National Academy of Sciences of the United States of America*. 3(10), 344-350.

2021

105. A.K. Tokranov, D.R. LeBlanc, H. Pickard, B. Ruyle, L.B. Barber, R.B. Hull, **E.M. Sunderland**, C.D. Vecitis. 2021. Surface-water/groundwater boundary effects on seasonal PFAS concentrations and PFAA precursor transformations. *Environmental Science: Processes & Impacts.* 23, 1893-1905.

104. M. Bhatia, A. Specht, V. Ramya, D. Sulaiman, M. Konda, P. Balcom, **E.M. Sunderland**, A. Qureshi. 2021. Portable XRF as a rapid determination tool to detect ppm levels of Ni, Zn, As and Pb in human toenails: A South India case study. *Environmental Science & Technology*. 55(19): 13113-13121.

103. V. Shah, D.J. Jacob, C.P. Thackray, X. Wang, **E.M. Sunderland**, T. Dibble, A. Saiz-Lopez, I. Cernusak, V. Kello, P. Castro, R. Wu, C. Wang. 2021. Improved mechanistic understanding of the atmospheric redox chemistry of mercury. *Environmental Science & Technology*. 55(21): 14445-14456.

102. X.C. Hu, B. Ge, B. Ruyle, J. Sun, **E.M. Sunderland**. 2021. A statistical approach for identifying private wells susceptible to PFAS contamination. *Environmental Science & Technology Letters*. 8(7): 596-602.

101. M. Alcala-Orozco, P. Balcom, **E.M. Sunderland**, J. Olivero-Verbel, K. Caballero-Gallardo. 2021. Occurrence of essential and toxic elements in canned fish (sardines and tuna) commercialized in the Latin American market: Public health at stake. *Food Additives and Contaminants: Part B*. 14(3), 206-218.

100. M. Enrico, P. Balcom, D.T. Johnston, J. Foriel, **E.M. Sunderland**. 2021. Simultaneous combustion preparation for mercury isotope analysis and detection of total mercury using a direct mercury analyzer. *Analytica Chimica Acta*. 1154, 338327.

99. B. Ruyle, H. Pickard, D. LeBlanc, A. Tokranov, C. Thackray, X.C. Hu, C.D. Vecitis, **E.M. Sunderland**. 2021. Isolating the AFFF signature in coastal watersheds using oxidizable PFAS precursors and unexplained organofluorine. *Environmental Science & Technology*. 55(6): 3686-3695.

98. R.A. Stern, P. Koutrakis, M. Martins, B. Lemos, S.E. Dowd, **E. Sunderland**, E. Garshick. 2021. Characterization of Hospital Airborne SARS-CoV-2. *Respiratory Research*. 22:73.

97. Y. Zhang, S. Dutkiewicz, **E.M. Sunderland**. 2021. Impacts of climate change on methylmercury formation and bioaccumulation in the 21st century ocean. *One Earth*. 4(2): 279–288.

96. A. Young, E. Sparer, H. Pickard, **E.M. Sunderland**, G. Peaslee, J.G. Allen. 2021. Per- and polyfluoroalkyl substances (PFAS) and total fluorine in fire station dust. *Journal of Exposure Science and Environmental Epidemiology*. https://doi.org/10.1038/s41370-021-00288-7.

95. R. Stern, N. Mahmoudi, C. Buckee, A. Schartup, P. Koutrakis, S. Ferguson, J. Wolfson, S. Wofsy, B. Daube, **E.M. Sunderland**. 2021. The microbiome of size fractionated airborne particles from the Sahara source region. *Environmental Science & Technology*. 55(3): 1487-1496.

94. A.O. De Silva, J.M. Armitage, T.A. Bruton, C. Dassuncao, W. Heiger-Bernays, X.C. Hu, A. Karrman, C. Ng, A. Robuck, M. Sun, T.F. Webster, **E.M. Sunderland**. 2021. PFAS exposure pathways for humans and wildlife: A synthesis of current knowledge and key gaps in understanding. *Environmental Toxicology and Chemistry*. 40(3): 631-657.

93. R. Lohmann, E. Markham, J. Klanova, P. Kukucka, P. Pribylova, X. Gong, T. Yanisheswki, C. Wagner, **E. Sunderland**. 2021. Trends of diverse POPs in air and water across the Western Atlantic Ocean: Strong gradients in the ocean, but not in the air. *Environmental Science & Technology*. 55(14): 9498-9507.

92. B.J. Ruyle, C.P. Thackray, J.P. McCord, M.J. Strynar, K.A. Mauge-Lewis, S.E. Fenton, **E.M. Sunderland**. 2021. Reconstructing the composition of poly- and perfluroalkyl substances (PFAS) in contemporary aqueous film forming foams. *Environmental Science & Technology Letters*. 8(1): 59-65.

2020

91. K. Schaefer, Y. Elshorbany, E. Jafarov, P.F. Schuster, R.G. Striegl, K.P. Wickland, **E.M. Sunderland**. 2020. Potential impacts of mercury released from thawing permafrost. *Nature Communications.* 11(1): 1-6.

90. H. Joerss, Z. Xie, C.C. Wagner, W-J von Appen, **E.M. Sunderland**, R. Ebinghaus. 2020. Transport of legacy perfluoroalkyl substances and the replacement compound HFPO-DA through the Atlantic gateway to the Arctic Ocean – Is the Arctic a sink or a source? *Environmental Science & Technology.* 54(16): 9958-9967.

89. X. Zhang, X. Sun, R. Jiang, E. Zeng, **E.M. Sunderland**, D.C.G. Muir. 2020. Screening new persistent and bioaccumulative organics in China's inventory of industrial chemicals. *Environmental Science & Technology*. 54(12): 7398-7408.

88. D. Bitounis, D. Parviz, X. Cao, C.A. Amadei, C.D. Vecitis, **E.M. Sunderland**, B.D. Thrall, M. Fang, M.S. Strano, P. Demokritou. 2020. Synthesis and physicochemical transformations of size-sorted graphene oxide during simulated digestion and its toxicological assessment against an in *in vitro* model of the human intestinal epithelium. *Small*. 16(21): 1907640.

87. Y. Zhang, A.L. Soerensen, A.T. Schartup, **E.M. Sunderland**. 2020. A global model for methylmercury formation and uptake at the base of marine food webs. *Global Biogeochemical Cycles.* 34 (2), e2019GB006348.

86. M. Li, A. Juang, J. Ewald, R. Yin, B. Mikkelsen, D.P. Krabbenhoft, P. Balcom, C. Dassuncao, **E.M. Sunderland**. 2020. Selenium and stable mercury isotopic analysis provide new insights into mercury toxicokinetics in pilot whales. *Science of the Total Environment*. 710: 136325.

85. M. Perkins, O.P. Lane, D.C. Evers, A. Sauer, N.J. O'Driscoll, S.T. Edmunds, J.C. Haelin, J. Trimble, **E.M. Sunderland**. 2020. Historical patterns of mercury exposure for North American songbirds. *Ecotoxicology.* 29(8):1161-1173.

2019

84. D.H. Fourie, I.M. Hedgecock, F. DeSimone, **E.M. Sunderland**, N. Pirrone. 2019. Are mercury emisssions from satellite electric propulsion an environmental concern? *Environmental Research Letters*. 14: 124021. https://doi.org/10.1088/1748-9326/ab4b75.

83. S. Cinnirella, D. Evelina Bruno, N. Pirrone, M. Horvat, I. Živković, D. Evers, S. Johnson, and **E.M. Sunderland**. 2019. Mercury concentrations in biota in the Mediterranean Sea, a compilation of 40 years of surveys. *Scientific Data*. 6: 205. https://doi.org/10.1038/s41597-019-0219-y.

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7. Hedgecock, N. Pirrone, A. Dastoor, L. Levin, C-J. Lin, R.P. Mason, **E. Sunderland**, O. Travnikov. 2010. Chapter 6: Summary. In: Hemispheric Transport of Air Pollution 2010, Part B: Mercury. N. Pirrone and T. Keating (Eds.) Air Pollution Studies No. 18. United Nations Economic Commission for Europe. United Nations, New York and Geneva.

6. **E.M. Sunderland**, E. Corbitt, D. Cossa, D. Evers, H. Friedli, D. Krabbenhoft, L. Levin, N. Pirrone, G. Rice. 2010. Impacts of Intercontinental Mercury Pollution on Human and Ecological Health. In: Hemispheric Transport of Air Pollution 2010, Part B: Mercury. N. Pirrone and T. Keating (Eds.) Air Pollution Studies No. 18. United Nations Economic Commission for Europe. United Nations, New York and Geneva.

5. **E.M. Sunderland,** C.D. Knightes, K. von Stackelberg, and N. Stiber. 2010. "Environmental Fate and Bioaccumulation Modeling at EPA: Application to Environmental Decision Making." In: G. Hanrahan (Ed.), Modelling of Pollutants in Complex Environmental Systems, Vol. II, ILM, UK, pp. 3-42.

4. U.S. EPA. 2009. *Final EPA Guidance on the Development, Evaluation and Application of Environmental Models.* (Principal authors: N. Gaber, P. Pascual, N. Stiber, **E. Sunderland**). EPA/100/K-09/003, EPA Council for Regulatory Environmental Modeling, Washington D.C, March 2009.

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2. U.S. EPA. 2005. **Lead author** for chapter: "*Ecosystem Scale Modeling for Mercury Benefits Assessment*." Chapter 3, Regulatory Impact Analysis of the Clean Air Mercury Rule, Final Report. EPA-452/R-05-003, Office of Air Quality Planning and Standards, Research Triangle Park, NC.

1. EPA Council for Regulatory Environmental Modeling. 2003. *Interim EPA Guidance for the Development, Evaluation and Application of Regulatory Environmental Models*. (Principal authors: P. Pascual, N. Stiber, **E. Sunderland**). Washington DC.

INVITED PRESENTATIONS

2024

123. Invited Plenary Talk, 10th International Conference on Marine Pollution and Ecotoxicology (ICMPE-10). Hong Kong, January 3, 2024.

2023

123. Invited presentation, International Workshop of the Consortium for Analysis and Remediation of PFAS Japan, Tokyo Japan, October 18, 2023.

122. Invited panelist on Resources for the Future (RFF) webinar on Unplugging Emissions: Exploring New EPA Rules on Climate and Health. Virtual. May 19, 2023.

121. Invited presentation at the 10th Annual "Six Classes" Toxics Retreat IV, Sequoia Retreat Center, Ben Lomond, CA, April 24, 2023.

120. Invited talk. Social & Economic Impacts of PFAS in the Great Lakes/Lake Champlain Region. Illinois-Indiana Sea-Grant. Virtual presentation. March 8, 2023.

119. Invited plenary talk. US EPA National Forum on Contaminants in Fish. Virtual Meeting, February 28, 2023.

2022

118. Invited presentation. International symposium: *Sustainable and visionary health research in a changeable world.* University of Southern Denmark (SDU), Odense, Denmark. December 15, 2022.

117. Invited seminar. Environmental Science and Engineering Seminar Series. California Institute of Technology. Pasadena, CA, November 30, 2022.

116. Invited webinar. NIH Superfund Research Program Risk e-Learning Webinar Series: Climate Change and Health. Session II: Untangling Complex Exposures and Health Effects. November 4, 2022.

115. Invited seminar. The George Washington University, Environmental Engineering Seminar, October 14, 2022.

114. Invited webinar, Green Chemistry and Commerce Council (GC3), September 1, 2022.

113. Invited plenary talk, 12th International Symposium on Geochemistry of the Earth's Surface, Zurich, Switzerland, July 24-29, 2022.

112. Invited talk. Artic Monitoring and Assessment Network: Contaminants in Arctic wildlife and humans – cross-cutting issues. June 21, 2022.

111. Invited seminar. Earth, Ocean and Atmospheric Sciences, University of British Columbia, Vancouver, BC. June 15, 2022.

110. Invited talk. Ocean Nexus Center North American Meeting. Virtual. June 14, 2022.

109. Invited panelist. 9th Annual World Ocean Summit, Economist Impact, March 3, 2022.

2021

108. Invited podcast. The Economist Impact on: Chemical Pollution in the Ocean, Back to Blue Initiative. December 22. https://backtoblueinitiative.com/back-to-blue-podcasts/

107. Invited Congressional Testimony. House Science, Space, and Technology Subcommittees on Environment and on Research and Technology. December 7, 2021.

106. Invited keynote talk. FLUOROS Global 2021: International Perspective on PFAS Science. Virtual meeting. October 3, 2021.

105. Invited seminar, North Carolina State Superfund Research Program, September 28, 2021.

104. Invited panelist, Environmental Working Group Symposium on PFAS, July 14, 2021.

103. Invited talk, National Academies of Science, Engineering, and Medicine Consensus Study on "Guidance on PFAS Testing and Health Outcomes," July 13, 2021.

102. Invited talk. Massachusetts Interagency PFAS Task Force, Virtual, June 15, 2021.

101. Invited talk. Physical Geography Seminar Series, University College London, Virtual seminar, May 20, 2021.

100. Invited talk. Environmental Metrology and Policy Program, Georgetown University. Virtual seminar, April 29, 2021.

99. Invited talk. Hemispheric Transport of Air Pollution (HTAP) Fate and Transport Partnership meeting, April 13, 2021.

98. Invited panelist for "Dark Waters" film discussion on the business and societal impacts of drinking water contamination. Harvard Business School Food, Agriculture and Water Club. March 24, 2021.

97. Invited panelist for 2021 PFAS Workshop. Institute for Journalism and Natural Resources. Virtual panel, Jan 27, 2021.

2020

96. Invited panelist. Minamata Online: Multimedia modelling. United Nations Environment Programme. Nov. 17, 2020.

95. Invited talk. University of Michigan Lifestage Environmental Exposures and Disease Center. Oct. 7, 2020.

94. Invited seminar. NOAA Chemical Sciences Laboratory Seminar Series. September 9, 2020.

93. Keynote talk. Emerging Contaminants Summit. Denver, Colorado, March 11, 2020.

92. Invited seminar, Doctoral Seminar Series, College of Pharmacy and Health Sciences, St John's University, Queens, New York, February 24, 2020.

2019

92. Invited plenary talk, North American Deposition Program (NADP) Meeting, Boulder, Colorado, November 6, 2019.

91. Invited seminar, University of Pittsburgh, Civil and Environmental Engineering Seminar, Pittsburgh, PA, Oct. 11., 2019.

90. Invited seminar, Gijs van Seventer Lectureship in Environmental Health, Boston University, Boston, MA, Oct. 4, 2019.

89. Invited talk, Symposium on Faroese Research on Health and Environment, Tórshavn, Faroe Islands, August 30, 2019.

88. Invited seminar, Institute of Coastal Research, Helmholtz-Zentrum Geesthacht, Hamburg, Germany, August 26, 2019.

87. Invited seminar, New Insights in Atmospheric Science Seminar Series, US EPA, Research Triangle Park, NC, August 15, 2019.

86. Invited talk, ESTCP and SERDP PFAS Project Meeting, San Diego, CA, July 31, 2019.

85. Invited seminar, Department of Estuarine and Ocean Sciences, University of Massachusetts, Dartmouth, MA, March 20, 2019.

84. Invited seminar, University of Toronto, Center for Global Change Science Distinguished Lecturer Series. Toronto, Canada, January 8, 2019.

2018

83. Invited talk, Harvard Club of Portland, Portland, OR, June 20, 2018.

82. Invited seminar, University of Rhode Island Superfund Center Trainees, Kingston, RI, May 21, 2018.

81. Invited seminar, Agency for Toxic Substances and Disease Research (ATSDR), Atlanta, GA, May 10, 2018.

80. Invited seminar, Department of Earth, Ocean and Atmospheric Sciences Seminar Series, University of British Columbia, Vancouver, Canada, May 3, 2018.

79. Invited presentation at the "Six Classes" Toxics Retreat IV, Sequoia Retreat Center, Ben Lomond, CA, May 1.

78. Invited talk, Harvard Club of Cape Cod, Falmouth, MA, April 27, 2018.

77. Invited presentation, Northeast Regional Superfund Program Meeting, Woods Hole Oceanographic Institute, Woods Hole, MA, March 26, 2018.

76. Invited presentation, Nereus Symposium on Health of the Oceans, Nippon Foundation, Tokyo, Japan, Dec. 22, 2018.

2017

75. Invited talk, Hertz Foundation Fellows East Coast Retreat, Woods Hole, MA, September 24, 2017.

74. Invited keynote talk, Goldschmidt 2017, Paris, France, August 13-18, 2017.

73. Invited talk and plenary panel, 13th International Conference on Mercury as a Global Pollutant, Providence, RI, July 16-21, 2017.

72. Invited talk, Highly Fluorinated Compounds – Social and Scientific Discovery, Northeastern University, Boston MA, June 14, 2017.

71. Invited seminar, Washington Harvard Alumni Special Interest Group, Washington DC, May 22, 2017.
70. Invited seminar, Science, Technology and Environmental Policy Seminar, Princeton University, Princeton NJ, April 10, 2017.
69. Invited seminar, Climate Change and Global Health Seminar, Harvard Global Health Institute, Cambridge MA, February 2, 2017.
68. Invited talk, Harvard Standing Committee on Women Mini-Symposium, Cambridge MA, February 27, 2017.
67. Invited talk, Global Food+ 2017 Symposium, Cambridge MA, February 24, 2017.

2016

66. Invited seminar, Saturday of Symposia, Harvard Club of Boston, Boston MA, December 5, 2016.
65. Invited seminar, U.S. Environmental Protection Agency, Washington DC, November 28, 2016.
64. Invited seminar, Nereus Program, University of British Columbia: Adapting to Global Changes in Oceans and Fisheries, Vancouver BC, Canada, November 17, 2016.
63. Invited talk, UNEP Global Mercury Partnership consultation meeting, Portland, ME, October 13, 2016.
62. Plenary talk, 18th International Conference on Heavy Metals in the Environment, Ghent, Belgium, September 12, 2016.
61. Invited presentation, Methylmercury mitigation and Muskrat Falls workshop, Happy Valley - Goose Bay, Labrador, Canada, August 4, 2016.
60. Invited talk, Gordon Research Conference: Organic Geochemistry, Holderness School NH, July 28, 2016.
59. Invited seminar, NOAA Geophysical Fluid Dynamics Laboratory (GFDL) Seminar Series, Princeton NJ, April 28, 2016.
58. Technical lead, Nunatsiavut Government press conference on risks to Inuit health of Muskrat Falls development, St. John's NL, Canada, April 18, 2016.
57. Invited panelist, Center for Public Leadership, Belfer Center, Harvard Kennedy School, Cambridge MA, Panel on Women and Climate Change, Cambridge MA, March 29, 2016.

2015

56. Invited talk, Transatlantic Science Week 2015 speaker, Boston MA, November 5, 2015.
55. Invited speaker, Faculty Forum, Harvard Alumni Association, Cambridge MA, October 23, 2015.
54. Invited plenary speaker, Arctic Circle Assembly 2015 plenary talk, Reykjavík, Iceland, October 17, 2015.
53. Invited speaker, ScienceWriters2015.org, Cambridge, MA, October 12, 2015.
52. Invited seminar, Metals research core seminar, Harvard NIEHS Center, Harvard School of Public Health, Boston MA, October 1, 2015.
51. Invited speaker, Faculty Forum, Harvard Alumni Association, Cambridge MA, May 29, 2015.
50. Invited seminar, Environmental Geology & Geochemistry Seminar, Princeton University, Princeton NJ, May 14, 2015.
49. Invited talk, Goldschmidt2015, Prague, CZ, August 17, 2015.

2014

48. Invited keynote talk, Goldschmidt2014, Sacramento, CA, June 8, 2014.
47. Invited seminar, Environmental Science and Engineering Seminar Series, Harvard School of Engineering and Applied Sciences, Cambridge MA, March 14, 2014.
46. Discussion lead, Harvard University Center for the Environment, Cambridge MA, January 28, 2014.
45. Invited seminar, Department of Chemistry Seminar Series, University of British Columbia, Vancouver BC, Canada, January 21, 2014.

2013

44. Plenary speaker, 11th International Conference on Mercury as a Global Pollutant, Edinburgh, Scotland (presented for medical reasons by D.P. Krabbenhoft), August 1, 2013.

43. Invited seminar, Graduate School of Oceanography Seminar Series, University of Rhode Island, Narrangansett RI, April 26, 2013.

2012

42. Invited seminar, Dartmouth College Superfund Program Seminar Series, Hanover NH, October 16, 2012.
41. Plenary speaker, 16th International Conference on Heavy Metals in the Environment (ICHMET), Rome, Italy, September 24, 2012.
40. Invited talk, Mercury Science in the Great Lakes Workshop, Chicago IL. May 30-31, 2012.
39. Invited seminar, School of Marine and Atmospheric Sciences Seminar Series, Stony Brook University, Stony Brook NY, February 3., 2012.

2011

38. Invited talk, Gulf of Mexico Alliance Mercury Meeting, Gulf Breeze FL, October 18, 2011.
37. Invited seminar, Interdisciplinary Seminar Series, Lafayette College, Easton PA, September 26, 2011.
36. Invited seminar, Superfund Research Program Seminar Series, Harvard School of Public Health, Boston MA, March 7, 2011.

2010

35. Invited talk, Gordon Research Conference – Environmental Sciences: Water, Holderness NH, June 20-25, 2010.
34. Invited meeting lead, U.S. EPA Meeting on Global Mercury Emissions and U.S. Exposures, Washington, DC. Jan. 14, 2010.

Prior to 2010

33. Invited talk, Northeast and Great Lakes Region Mercury Science & Policy Conference, Chicago IL, November 18, 2009.
32. Invited talk, 10th National Forum on Contaminants in Fish, Portland OR, November 2-5, 2009.
31. Invited presentation, Session hosted by the National Institute for Minamata Disease (NIMD), 9th International Conference on Mercury as a Global Pollutant, Guiyang, China. June 7-12, 2009.
30. Invited presentation, UNECE/CLRTAP Task Force on Hemispheric Transport of Air Pollution, St. Petersburg, Russia, April 1-3, 2009.
29. Invited presentation, International Air Quality Advisory Board, Washington DC. April 15, 2009.
28. Invited talk, Gulf of Mexico Mercury Workshop, Gulfport MS, December 2-4, 2008.
27. Invited talk, 5th Annual Northwest Water Quality Modelers Meeting, Hood River OR, May 2-3, 2008.
26. Invited roundtable panelist, International Joint Commission Nearshore Priority Expert Consultation Part II, Dearborn MI, March 12-13, 2008.
25. Invited talk, Joint ASLO and AGU Ocean Sciences Meeting, Orlando FL. March 2-7, 2008.
24. Invited seminar, New England Tribal Council, Boston MA, December 11, 2007.
23. Invited seminar, US EPA Region 1 Science Council Seminar Series, Boston MA, August 29, 2007.
22. Invited seminar, New England Interstate Water Pollution Control Commission Fish Consumption Workgroup, Lowell MA, April 3, 2007.
21. Invited talks, Lake Ontario Contaminant Monitoring, Modeling and Research Workshop, Grand Island NY, March 27-28, 2007.
20. Invited seminar, Harvard Center for Risk Analysis Seminar Series, Harvard School of Public Health, Boston MA, March 5, 2007.
19. Invited talk, US EPA's Mercury Coordination Workgroup, Washington DC, February 28, 2007.
18. Invited seminar, Dartmouth Toxic Metals Research Program and Sea Grant Sponsored Workshop, Durham NH, November 15-16, 2006.
17. Invited seminar, Marine Science Program Seminar Series, University of Connecticut, Groton CT, October 13, 2006.
16. Invited seminar, NOAA Great Lakes Environmental Research Laboratory Seminar Series, Ann Arbor MI, September 14, 2006.

15. Invited talk, USGS/US EPA Roundtable on Mercury in the Environment, Washington DC, April 13, 2006.
14. Invited seminar, US EPA Region 1 Regional Science Council Seminar Series, Boston MA, March 1, 2006.
13. Invited seminar, University of British Columbia, School of Occupational and Environmental Hygiene Seminar Series, Vancouver BC, Canada, February 3, 2006.
12. Invited talk, US Army Corps of Engineers Committee on Water Quality, San Francisco CA, August 30, 2005.
11. Invited plenary talk, Shared Air Summit sponsored by the Premier of Ontario, Toronto ON, Canada, June 20, 2005.
10. Invited talks, Biennial Meeting of the International Joint Commission, Kingston ON, Canada. Two Invited talks. June 9-11, 2005.
9. Invited talk, NOAA- US EPA Scientist-to-Scientist Meeting on Multi-Media Aspects of Environmental Pollution in Coastal and Marine Environments. Laurel MD, June 2, 2005.
8. Invited seminars, Ontario Ministry of the Environment, Toronto/Dorset ON, Canada, April 20&22, 2005.
7. Invited talk, US EPA's Scientific Advisory Board, Panel on Regulatory Environmental Modeling, Washington DC, February 7-9, 2005.
6. Invited seminar, International Air Quality Advisory Board of the International Joint Commission, Vancouver BC, Canada, January 26, 2005.
5. Invited seminars, Department of Fisheries and Oceans Canada, Bedford Institute of Oceanography, Halifax NS, Canada, January 13&15, 2005.
4. Invited seminar, US EPA Mercury in Marine Life Workgroup, Office of Water. Washington DC, July 10, 2004.
3. Invited talk, USGS/US EPA Mercury Roundtable on Tools for Modeling Fish Bioaccumulation and Potential Health Effects, Washington DC, June 4, 2004.
2. Invited talk, 4th International Conference on Air Quality: Mercury, Trace Elements and Particulate Matter, Arlington VA, September 22-24, 2003.
1. Invited talk, Woodrow Wilson International Center for Scholars, Washington DC, June 20, 2003.